CHAIRMAN
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101 WESTWARD DRIVE #2
MIAMI SPRINGS FL 33166

TROPICAL AUDUBON SOCIETY
18014 S W 83 COURT
MIAMI FL 33157

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PALM BEACH GARDENS FL 33410

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FLORIDA HOUSE OF REPRESENTATIVES
50 S MILITARY TRAIL #205
WEST PALM BEACH FL 33415

THE HONORABLE CAROL HANSON
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DELRAY BEACH FL 33483

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FORT LAUDERDALE FL 33308

THE HONORABLE WILLIAM G MYERS
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50 KINDRED ST #301
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THE HONORABLE ROBERT WEXLER
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THE HONORABLE JIM SCOTT
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POMPANO BEACH FL 33062

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CITY PARK MALL 128 S E 1 STREET
FORT LAUDERDALE FL 33301

THE HONORABLE M MANDY DAWSON
FLORIDA HOUSE OF REPRESENTATIVES
612 N ANDREWS AVENUE
FORT LAUDERDALE FL 33311

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LAUDERDALE LAKES FL 33319

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4800 W COPANS ROAD
COCONUT CREEK FL 33063

THE HONORABLE BEN GRABER
FLORIDA HOUSE OF REPRESENTATIVES
2929 UNIVERSITY DRIVE 200
CORAL SPRINGS FL 33065

THE HONORABLE DEBBIE W SCHULTZ
FLORIDA HOUSE OF REPRESENTATIVES
13090 WEST STATE ROAD 84
DAVIE FL 33325

THE HONORABLE STEVEN BRIAN FEREN
FLORIDA HOUSE OF REPRESENTATIVES
400 N W 73 AVENUE
PLANTATION FL 33317

THE HONORABLE ANNE MACKENZIE
FLORIDA HOUSE OF REPRESENTATIVES
1000 S FEDERAL HIGHWAY 105
FORT LAUDERDALE FL 33316

THE HONORABLE FRED LIPPMAN
FLORIDA HOUSE OF REPRESENTATIVES
4000 HOLLYWOOD BOULEVARD 330 N
HOLLYWOOD FL 33021-6744

THE HONORABLE STEVEN GELLER
FLORIDA HOUSE OF REPRESENTATIVES
1250 E HALLANDALE BEACH BLVD 604
HALLANDALE FL 33009

THE HONORABLE HOWARD FORMAN
FLORIDA STATE SENATE
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HOLLYWOOD FL 33021-6744

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7880 N UNIVERSITY DR 301
TAMARAC FL 33321

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13500 NORTH KENDALL DRIVE
SUITE 220
MIAMI FL 33186

THE HONORABLE HARRY JOHNSTON
U S HOUSE OF REPRESENTATIVES
1501 CORPORATE DRIVE 205
BOYNTON BEACH FL 33426

THE HONORABLE PETER DEUTSCH
U S HOUSE OF REPRESENTATIVES
10100 PINES BOULEVARD
PEMBROKE PINES FL 33025

THE HONORABLE E CLAY SHAW
U S HOUSE OF REPRESENTATIVES
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FORT LAUDERDALE FL 33301

THE HONORABLE ALCEE L HASTINGS
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OAKLAND PARK FL 33311

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MIAMI FL 33130

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UNITED STATES SENATE
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MIAMI FL 33131

TOWN MANAGER
TOWN OF PALM BEACH
P O BOX 2029
PALM BEACH FL 33480

MAYOR
TOWN OF PALM BEACH SHORES
247 EDWARDS LANE
PALM BEACH SHORES FL 33404

MAYOR
CITY OF RIVIERA BEACH
600 W BLUE HERON BOULEVARD
RIVIERA BEACH FL 33404

CITY MANAGER
CITY OF RIVIERA BEACH
600 W BLUE HERON BOULEVARD
RIVIERA BEACH FL 33404

MAYOR
TOWN OF SOUTH PALM BEACH
3577 S OCEAN BOULEVARD
SOUTH PALM BEACH FL 33480

TOWN MANAGER
TOWN OF SOUTH PALM BEACH
3577 S OCEAN BOULEVARD
SOUTH PALM BEACH FL 33480

MAYOR
VILLAGE OF TEQUESTA
P O BOX 3273
TEQUESTA FL 33469

VILLAGE MANAGER
VILLAGE OF TEQUESTA
P O BOX 3273
TEQUESTA FL 33469

CITY MANAGER
CITY OF DANIA
CITY HALL
100 W DANIA BEACH BLVD
DANIA FL 33004

MAYOR
CITY OF DANIA
CITY HALL
100 W DANIA BEACH BLVD
DANIA FL 33004

CITY MANAGER
CITY OF DEERFIELD BEACH
CITY HALL
150 N W SECOND AVENUE
DEERFIELD BEACH FL 33441

MAYOR
CITY OF DEERFIELD BEACH
CITY HALL
150 N W SECOND AVENUE
DEERFIELD BEACH FL 33441

CITY MANAGER
CITY OF FORT LAUDERDALE
CITY HALL
P O DRAWER 14250
FORT LAUDERDALE FL 33302

MAYOR
CITY OF FORT LAUDERDALE
CITY HALL
P O DRAWER 14250
FORT LAUDERDALE FL 33302

CITY MANAGER
CITY OF HALLANDALE
CITY HALL
308 S DIXIE HIGHWAY
HALLANDALE FL 33009

MAYOR
CITY OF HALLANDALE
CITY HALL
308 S DIXIE HIGHWAY
HALLANDALE FL 33009

TOWN MANAGER
TOWN OF HILLSBORO BEACH
TOWN HALL
1210 HILLSBORO BEACH
POMPANO BEACH FL 33062

MAYOR
TOWN OF HILLSBORO BEACH
TOWN HALL
1210 HILLSBORO BEACH
POMPANO BEACH FL 33062

CITY MANAGER
CITY OF HOLLYWOOD
CITY HALL
P O BOX 229045
HOLLYWOOD FL 33022-9045

MAYOR
CITY OF HOLLYWOOD
CITY HALL
P O BOX 229045
HOLLYWOOD FL 33022-9045

TOWN MANAGER
TOWN OF LAUDERDALE-BY-THE-SEA
TOWN HALL
4501 OCEAN DRIVE
LAUDERDALE-BY-THE-SEA FL 33308

MAYOR
TOWN OF LAUDERDALE-BY-THE-SEA
TOWN HALL
4501 OCEAN DRIVE
LAUDERDALE-BY-THE-SEA FL 33308

Mr. Kenneth Oprisko, Chief, Labor Relations Branch, Field Advisory Services Division, Defense Civilian Personnel Management Service, 2461 Eisenhower Ave., Hoffman Building #1, Suite 152, Alexandria, VA 22331–0900, (703) 325–1380.

Dated: November 21, 1994.

Patricia L. Toppings,

Alternate OSD Federal Register Liaison Officer, Department of Defense.

[FR Doc. 94–29146 Filed 11–25–94; 8:45 am]

BILLING CODE 5000–04–M

Department of the Army

Intent To Prepare a Draft Environmental Impact Statement (DEIS) for the Coast of Florida Erosion and Storm Effects Study in Palm Beach, Broward, and Dade Counties, Florida

AGENCY: U.S. Army Corps of Engineers, DOD.

ACTION: Notice of intent.

SUMMARY: The Jacksonville District, U.S. Army Corps of Engineers intends to prepare a Draft Environmental Impact Statement for Region III of the Coast of Florida Erosion and Storm Effects Study. The study is a cooperative effort between the Corps of Engineers and the Florida Department of Environmental Protection, the study sponsor, to investigate coastal processes on a regional basis to recommend modifications for existing shore protection and navigation projects.

ADDRESSES: U.S. Army Gorps of Engineers, Jacksonsville District, Environmental Branch, Planning Division, P.O. Box 4970, Jacksonville, Florida 32232–0019.

FOR FURTHER INFORMATION CONTACT: Mr. Michael Dupes, (904) 232–1689.

SUPPLEMENTARY INFORMATION: 1. The Coast of Florida Erosion and Storm Effects Study was authorized on 16 July 1984, by Section 104 of the 1985 Appropriations Act (Public Law 98–360). The study area includes most of the Atlantic and Gulf coast of Florida and has been divided into five coastal regions. The region currently being studied, and is the focus of the DEIS, is Region III which consists of 92 miles of Atlantic Ocean coastline within Palm beach, Broward, and Dade counties. Several alternatives are being considered in the study and will be addressed in the DEIS. These include:

a. Continued renourishment of existing projects,

b. Design modifications to existing projects where needed,

c. Sand bypassing at inlets using sand transfer plants and/or conventional dredging,

d. Nearshore placement of suitable maintenance dredged material to feed adjacent beaches,

5. Use of suitable maintenance dredged material as beach fill,

6. Construction of groins and/or offshore breakwaters,

7. Dune construction,

8. Construction of sand traps at inlets to aid in sand-bypassing,

9. Sand tightening existing jetties where the need has been identified. Sources of sand that have been identified include offshore borrow areas, upland sand sources, suitable material from maintenance dredging and the possible use of Bahamian aragonite.

2. Scoping: The scoping process will involve Federal, State, county and municipal agencies, and other interested persons and organizations. A scoping letter (November 8, 1994) has been sent to interested Federal, State, county and municipal agencies requesting their comments and concerns. Any persons and organizations wishing to participate in the scoping process should contact the U.S. Army Corps of Engineers at the above address. Significant issues that are anticipated include concern for offshore hard bottom communities, fisheries, water quality, sea turtles and cultural resources.

3. Coordination with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service will be accomplished in compliance with section 7 of the Endangered Species Act. Coordination required by applicable Federal and State laws and policies will be conducted. Since the project will require the discharge of material into waters of the United States, the discharge will comply with the provisions of section 404 of the Clean Water Act as amended.

4. DEIS Preparation: It is estimated that the DEIS will be available to the public during May of 1995.

Kenneth L. Denton,

Army Federal Register Liaison Officer.

[FR Doc. 94–29135 Filed 11–25–94; 8:45 am]

BILLING CODE 3710–AJ–M

Availability for Exclusive, Partially Exclusive, or Nonexclusive Licensing of a U.S. Patent Concerning a Shaping Apparatus for an Explosive Charge

AGENCY: U.S. Army Engineer Waterways Experiment Station, DOD.

ACTION: Notice of availability.

UMMARY: In accordance wi 04.7(a)(1)(i), announcemer he availability of U.S. Pate or licensing. This patent ha ssigned to the United State s represented by the Secre rmy, Washington, D.C.

DDRESSES: U.S. Army Cor ngineers, Waterways Expe tation, ATTN: CEWES–CT icksburg, MS 39180–6199

OR FURTHER INFORMATION C Ir. Jack A. Little, (601) 634

UPPLEMENTARY INFORMATIO nvention provides a shapi or an explosive charge to b n Explosively Formed Pen he shaping apparatus com onmetal mold in the form f a cone with a latch and h ttached thereto. The mold acked with a plastic bond o form an explosive charg FPs are limited in perfor oor projectile formation p aused by nonuniform app he explosive into the rear FP. This invention disclo f an explosive shaping ap which provides uniform ap he explosive on to the EFP mproved EFP slug formati haracteristics. The EFP st s increased by as much as tandoff munitions, like th ide potential application se, including demolition unkers and off-road mine dditionally, the EFP coul he mining industry to cle

Under the authority of s f the Federal Technology f 1986 (Pub. L. 99–502) a f title 35, U.S. Code, the I he Army, Corps of Engine Waterways Experiment St o license the above Unite n an exclusive, partially e on-exclusive manner to a nterested in using the tec escribed in the above me patent. Any interested par o submit a proposal for a partially exclusive, or non icense. The proposals for echnology will be evalua ollowing criteria: technic ize of business, and deve lan.

enneth L. Denton, rmy Federal Register Liaiso

FR Doc. 94–29136 Filed 11–

BILLING CODE 3710–PU–M

Appendix D

PERTINENT CORRESPONDENCE

United States Department of the Interior

OFFICE OF THE SECRETARY
OFFICE OF ENVIRONMENTAL POLICY AND COMPLIANCE
Richard B. Russell Federal Building
75 Spring Street, S.W.
Atlanta, Georgia 30303

October 30, 1996

ER-96/517

Colonel Terry Rice,
District Engineer
U. S. Army Corps of Engineers
P. O. Box 4970
Jacksonville, FL 32232-0019

Dear Colonel Rice:

This is a follow-up letter to the Department's comments dated September 17, 1996, on the Draft Feasibility Report and Draft Environmental Impact Statement for the Coast of Florida Erosion and Storm Effects Study, Region III. This letter is provided to clarify comments contained in that letter.

The Draft Feasibility Report and EIS indicates that three (3) actions are currently proposed for Federal participation (sand transfer plants at Lake Worth Inlet and South Lake Worth Inlet and beach nourishment at Dania). The document indicates that these actions would have minimal effects on hardgrounds, endangered species, and other fish and wildlife resources. The Fish and Wildlife Service does not object, under certain conditions, to these three (3) projects.

Our recommendation for approval of these features in the final feasibility report is contingent upon: 1.) The Corps obtaining a segment specific Coordination Act Report (CAR) prior to final design and construction; and 2.) Verification of minimal impact on fish and wildlife resources.

I hope this information clarifies our previous comments. If there are questions, please call either my office at 404/331-4524, or the Vero Beach Office of the Fish and Wildlife Service at 407/562-3909.

Sincerely,

James H. Lee

James H. Lee
Regional Environmental Officer

CC: OEPC, WASO
FWS-ES, RO
FWS, VBFO

United States Department of the Interior

OFFICE OF THE SECRETARY
OFFICE OF ENVIRONMENTAL POLICY AND COMPLIANCE
Richard B. Russell Federal Building
75 Spring Street, S.W.
Atlanta, Georgia 30303

September 17, 1996

ER 96/0517

Colonel Terry Rice
District Engineer
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Dear Colonel Rice:

The Department of the Interior (Department) has reviewed the Draft Feasibility Report and Draft Environmental Impact Statement (DEIS) for the Coast of Florida Erosion and Storm Effects Study, Region III.

The Draft Feasibility Report identifies as many as 27 federal projects, 14 of which require first time Congressional authorization, spanning 60 miles of coastline in Dade, Broward, and Palm Beach Counties, Florida. These federal Civil Works projects involve construction of breakwaters, groins and nearshore berms and dredging of sand for beach nourishment, as well as construction of sand transfer facilities, for storm protection purposes.

The Department offers the following comments.

DRAFT ENVIRONMENTAL IMPACT STATEMENT

General Comments

The DEIS includes an "Interim Fish and Wildlife Coordination Act Report" from the the U.S. Fish and Wildlife Service (FWS), Vero Beach, Florida, dated September 30, 1994. That report was provided to the Army Corps of Engineers (Corps) in partial fulfillment of the coordination requirements of section 2(b) of the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*) (Act), and, as stated in the report, does not represent the final report, based on the surveys and views of the FWS, of the Secretary of the Interior to Congress. Accordingly, further coordination between the Corps and the FWS will be required as more detailed project plans are formulated for each federal project.

Until the necessary coordination with the FWS is completed, the Department recommends that those projects and project modifications not be authorized. This recommendation is based on the lack of sufficient environmental assessment of the affected nearshore

subtidal habitats. Specifically, according to the DEIS, a total of 61 acres of subtropical and tropical living reef would be eliminated due to direct burial. Unknown impacts would also occur to coral reefs located adjacent to proposed borrow sites. The cumulative effects of multiple federal projects encompassing over 60 miles of the coastline of southeast Florida on the living marine resources (important recreational and commercial taxa of finfishes and crustaceans) has not been adequately documented, nor has the FWS been afforded the opportunity to "*determine the possible damage to wildlife resources*" and to determine "*means and measures that should be adopted to prevent the loss or damage to such wildlife resources*" as required in section 2(b) of the Act.

The Department also supports the recommendations of the Corps in paragraphs 315 and 315a of the Draft Feasibility Report that these projects not be authorized based on the President's commitment to focus limited federal resources on the development of water resources projects that have national significance.

Consultation under Section 7 of the Endangered Species Act of 1973, as amended, (16 U.S.C. 1531 *et seq.*) has been initiated by the Corps concerning the proposed projects. A biological opinion addressing potential adverse effects on four species of threatened and endangered sea turtles will be issued in the near future.

Thank you for providing us with this opportunity to provide these comments. If you require further clarification or assistance please contact Charles Sultzman or David Ferrell of the FWS's Vero Beach, Florida, Office at (407) 562-3909.

Sincerely,

James H. Lee
Regional Environmental Officer

RESPONSE TO COMMENTS FROM THE U.S. DEPARTMENT OF THE INTERIOR, LETTER DATED SEPTEMBER 17, 1996.

1. Paragraph 4. We do not agree that projects or modifications recommended in the Feasibility Report should not be authorized. However, we do concur that additional environmental assessment and coordination with the USFWS is needed. The additional environmental work and coordination would occur during the planning, engineering and design (PED) phase for any project authorized. Supplemental NEPA documentation would also be completed and the USFWS will be able to perform the required environmental assessments needed to fulfill section 2(b) of the Fish and Wildlife Coordination Act.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
P.O. Box 2676
Vero Beach, Florida 32961-2676
October 24, 1996

IN REPLY REFER TO:

Colonel Terry Rice
District Engineer
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

Attn: Planning Division

FWS Log No.: 4-1-96-F-268
Project: Coast of Florida Study, Region III

Dear Colonel Rice:

The U.S. Fish and Wildlife Service (FWS) has reviewed the draft Feasibility Report for the Coast of Florida Erosion and Storm Effects Study, Region III submitted by the U.S. Army Corps of Engineers (COE). This letter represents the FWS' biological opinion on the effects of the planned actions within this report in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (ESA). Effects of the planned actions on other resources such as nearshore reefs remain to be addressed in accordance with section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. *et seq.*).

This biological opinion programmatically addresses beach nourishment and renourishment in Region III. According to the COE's Biological Assessment (BA), separate biological opinions will be prepared for individual projects at a more advanced planning stage. This biological opinion is based on information provided from the following sources: the Feasibility Report, which includes a draft Environmental Impact Statement (DEIS), the BA for the Coast of Florida Study, Region III, from the Florida Department of Environmental Protection (FDEP), from Palm Beach, Broward, and Dade Counties, field investigations, previous biological opinions prepared for similar actions in the action area as well as other published and unpublished sources of information. A complete administrative record of this consultation is on file in the FWS' South Florida Ecosystem Office in Vero Beach, Florida.

CONSULTATION HISTORY

On October 5, 1995, the COE provided the FWS with a BA and a letter requesting formal consultation on threatened and endangered sea turtles as a result of the proposed actions associated with the Coast of Florida Study, Region III.

In a letter dated February 14, 1996, the FWS requested from the COE an estimate of the number of proposed projects which could be constructed within a single year. In this letter, the FWS notified the COE that formal consultation could not be initiated without this information.

In a letter dated March 28, 1996, the COE provided the FWS with the information requested above.

On July 9, 1996, the FWS notified the COE that the information provided is sufficient, formal consultation is initiated, and a biological opinion would be provided by August 23, 1996.

In August 1996, a revised DEIS for the Coast of Florida Study was received by the FWS.

BIOLOGICAL OPINION

Description of the proposed action

The Feasibility Report summarizes the COE's cooperative, cost-shared feasibility study on beach erosion and storm damage problems of the Atlantic Ocean shoreline along the southeast coast of Florida. The COE proposes to construct 27 shore protection projects consisting of beach nourishment, beach renourishment and sand transfer (See Table 1). These project segments span 93 kilometers of shoreline in Palm Beach, Broward and Dade Counties. Thirteen of these 27 projects have been previously authorized as Civil Works projects. Fourteen of the projects will require Congressional authorization.

Table 1. Project Plans Proposed in the Coast of Florida Study, Region III

Project Name	Project Type	Status
Bakers Haulover Inlet	0.1 Km Sand Transfer	New Project
Bal Harbour, Surfside, Miami Beach	14.3 Km Renourishment	Authorized Project
Boca Raton	2.3 Km Renourishment	Authorized Project
Dania Beach	1.0 Km Renourishment	New Project
Deerfield Beach	7.2 Km Renourishment	New Project
Delray Beach	4.3 Km Renourishment	Authorized Project
Fort Lauderdale	1.3 Km Renourishment	New Project
Golden Beach	1.8 Km Renourishment	New Project
Government Cut	0.3 Km Jetty Tightening	New Project
Highland Beach	5.1 Km Renourishment	New Project
Hillsboro Inlet	0.3 Km Sand Trap	New Project
Hollywood\Hallandale	8.5 Km Renourishment	Authorized
John U. Lloyd	3.7 Km Renourishment	Authorized
Jupiter\Juno Beach	4.8 Km Renourishment	Authorized Project
Key Biscayne	5.2 Km Renourishment	Authorized Project
Lake Worth Inlet	0.9 Km Sand Transfer	New Project
N. Palm Beach Island	3.0 Km Renourishment	Authorized Project
Ocean Ridge	2.4 Km Renourishment	Authorized Project
Palm Beach Island	4.3 Km Renourishment	Authorized Project
Pompano\Lauderdale by the Sea	8.5 Km Renourishment	Authorized
Port Everglades	.3 Km Sand Transfer	New Project
Port Everglades	Spur and Breakwater	New Project
Riviera Beach	1.7 Km Groin or Breakwater	New Project

Table 1. Project Plans Proposed in the Coast of Florida Study, Region III

Riviera Beach	2.7 Km Dune	New Project
S. Palm Beach Island	4.8 Km Renourishment	Authorized Project
So. Lake Worth Inlet	0.4 Km Sand Transfer	New Project
Sunny Isles	4.0 Km Renourishment	Authorized Project

Action Area

The action area for this Biological Opinion includes all shoreline where fill is proposed to be deposited or removed for transfer across an inlet, which amounts to 36 km of shoreline in Palm Beach County, 34 km in Broward County and 26.6 km in Dade County.

The COE has determined that the planned actions in the Coast of Florida Study, Region III may affect sea turtle nesting. Our records indicate that the threatened loggerhead sea turtle (*Caretta caretta*), as well as the endangered green sea turtle (*Chelonia mydas*), leatherback sea turtle (*Dermochelys coriacea*) and hawksbill sea turtle (*Eretmochelys imbricata*), nest on the beaches in Palm Beach, Broward, and Dade Counties.

Status of the species

The FWS has responsibility for protecting sea turtles when they come ashore to nest. The National Marine Fisheries Service (NMFS) has responsibility over sea turtles in the marine environment. In applying the jeopardy standard under the ESA, the FWS has determined that sea turtle species occurring in the U.S. represent populations that qualify for separate consideration under section 7 of the ESA. Therefore, even though sea turtles are wide-ranging and have distributions outside the U.S., the FWS only considers the U.S. populations of sea turtles when making jeopardy or no jeopardy determinations under section 7.

The reproductive strategy of sea turtles involves producing large numbers of offspring to compensate for the high natural mortality through their initial years of life. For at least two decades, several human-caused mortality factors have contributed to the decline of sea turtle populations along the Atlantic coast and in the Gulf of Mexico (National Research Council 1990a). These factors include commercial over-utilization of eggs and turtles, incidental catches in commercial fishing operations, degradation of nesting habitat by coastal development, and marine pollution and debris. Therefore, human activities that affect the behavior and/or survivability of turtles on the remaining nesting beaches, particularly the few high density nesting beaches, could seriously reduce our ability to protect sea turtles.

Loggerhead sea turtle

The loggerhead sea turtle, which was listed as a threatened species on July 28, 1978 (43 FR 32800), inhabits the continental shelves and estuarine environments along the margins of the Atlantic, Pacific, and Indian Oceans. Loggerhead sea turtles nest within the continental U.S. from Louisiana to Virginia. Major nesting concentrations in the U.S. are found on the coastal islands of North Carolina, South Carolina, and Georgia, and on the Atlantic and Gulf coasts of Florida (Hopkins and Richardson 1984). Total estimated nesting in the southeastern U.S. is approximately 50,000 to 70,000 nests per year (NMFS and FWS 1991b).

From a global perspective, the southeastern U.S. nesting aggregation is of paramount importance to the survival of the species and is second in size only to the population that nests on islands in the Arabian Sea off of Oman (Ross 1982, Ehrhart 1989, NMFS and FWS 1991b). The status of the Oman colony has not been evaluated recently, but its location in a part of the world that is vulnerable to disruptive events (e.g., political upheavals, wars, catastrophic oil spills) is cause for considerable concern (Meylan *et al.* 1995). The loggerhead nesting aggregations in Oman, the southeastern U.S., and Australia account for about 88 percent of nesting worldwide (NMFS and FWS 1991b). About 80 percent of loggerhead nesting in the southeastern U.S. occurs in six Florida counties: Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward (NMFS and FWS 1991b).

Recent genetic analyses using restriction fragment analysis and direct sequencing of mitochondrial DNA have been employed to resolve management units among loggerhead nesting cohorts of the southeastern U.S. (Bowen *et al.* 1993; B.W. Bowen, University of Florida, Gainesville, in litt., November 17, 1994, and October 26, 1995). Assays of nest samples from North Carolina to the Florida Panhandle have identified three genetically distinct nesting populations: (1) northern nesting population - Hatteras, North Carolina, to Cape Canaveral, Florida; (2) South Florida nesting population - Cape Canaveral to Naples, Florida; and (3) Florida Panhandle nesting population - Eglin Air Force Base and the beaches around Panama City, Florida. These data indicate that gene flow between the three regions is very low. If nesting females are extirpated from one of these regions, regional dispersal will not be sufficient to replenish the depleted nesting population (Bowen *et al.* 1993, B.W. Bowen, University of Florida, Gainesville, in litt., October 26, 1995).

Green sea turtle

The green sea turtle, which was listed as an endangered species on July 28, 1978 (43 FR 32800), has a worldwide distribution in tropical and subtropical waters. Major green sea turtle nesting colonies in the Atlantic Ocean occur on Ascension Island, Aves Island, Costa Rica, and Surinam. Breeding populations of the green sea turtle in Florida and along the Pacific coast of Mexico are listed as endangered; all other populations are listed as threatened.

Within the U.S., green sea turtles nest in small numbers in the U.S. Virgin Islands and Puerto Rico, and in larger numbers along the east coast of Florida, particularly in Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward Counties (NMFS and FWS 1991a). Nesting also has been documented along the Gulf coast of Florida on Santa Rosa Island (Okaloosa and Escambia Counties) and from Pinellas County through Collier County (FDEP, unpublished data).

Green sea turtles have been known to nest in Georgia, but only on rare occasions (Georgia Department of Natural Resources, unpub. data) and they nest sporadically in North Carolina (North Carolina Wildlife Resources Commission, unpublished data). No green sea turtle nesting has been documented in South Carolina (S. Murphy, South Carolina Department of Natural Resources, in litt., November 8, 1995). Unconfirmed nesting of green sea turtles in Alabama has been reported (R. Dailey, Bon Secour National Wildlife Refuge, personal communication).

Leatherback sea turtle

The leatherback sea turtle, which was listed as an endangered species on June 2, 1970 (35 FR 8491), is found in the Atlantic, Pacific and Indian Oceans. Leatherback sea turtles have been recorded as far north as Labrador and Alaska and as far south as Chile and the Cape of Good Hope. Nesting grounds are distributed circumglobally, with the Pacific Coast of Mexico supporting the world's largest known

concentration of nesting leatherbacks. The largest nesting colony in the wider Caribbean region is found in French Guiana, but nesting occurs frequently, although in lesser numbers, from Costa Rica to Columbia and in Guyana, Surinam, and Trinidad (NMFS and FWS 1992, National Research Council 1990a).

Leatherback sea turtles regularly nest in the U.S. in Puerto Rico, the U.S. Virgin Islands, and along the Atlantic coast of Florida as far north as Georgia (NMFS and FWS 1992). Leatherback turtles have been known to nest in Georgia and South Carolina, but only on rare occasions (Georgia and South Carolina Departments of Natural Resources, unpublished data). Leatherback nesting also has been reported on the west coast of Florida on St. Vincent National Wildlife Refuge (LeBuff 1990), St. Joseph Peninsula State Park (FDEP, unpublished data), and St. George Island (T. Lewis, St. Vincent National Wildlife Refuge, personal communication); a false crawl (non-nesting emergence) has been observed on Sanibel Island (LeBuff 1990).

Hawksbill sea turtle

The hawksbill sea turtle, which was listed as an endangered species on June 2, 1970 (35 FR 8491), is found in tropical and subtropical seas of the Atlantic, Pacific, and Indian Oceans. The species is widely distributed in the Caribbean Sea and western Atlantic Ocean. Within the continental U.S., hawksbill sea turtle nesting is rare and is restricted to the southeastern coast of Florida (Volusia through Dade Counties) and the Florida Keys in Monroe County (Meylan 1992, Meylan *et al.* 1995). Hawksbill tracks are difficult to differentiate from those of loggerheads and may not be recognized by surveyors. Therefore, surveys in Florida probably underestimate actual hawksbill nesting numbers (Meylan *et al.* 1995). In the U.S. Caribbean, hawksbill nesting occurs on beaches throughout Puerto Rico and the U.S. Virgin Islands (NMFS and FWS 1993).

ENVIRONMENTAL BASELINE

Status of the species in the action area

A. Nesting within Region III compared to nesting statewide

The following discussion of sea turtle nesting within Palm Beach, Broward, and Dade Counties, as well as comparisons to statewide nesting trends, was derived from data provided by Meylan *et al.* (1995) and Meylan (unpublished data). Meylan *et al.* (1995) tabulates the results of nesting surveys throughout Florida between 1979 and 1992. Unpublished data are available for the 1993 and 1994 nesting seasons.

Approximately 25 percent of Florida's sea turtle nesting occurs annually in the tri-county area known as Region III. During the nesting seasons from 1979 to 1992, loggerhead sea turtles laid 21.8 percent of their nests within Region III; green sea turtles laid 28.4 percent; and leatherbacks laid 54.7 percent. Hawksbill sea turtles reportedly laid 64 percent of their nests on Region III beaches; however, total nesting activity was low (11 nests state-wide) and this high percentage could be due to factors other than regional nesting preference.

Statewide and within Region III of the Coast of Florida Study, loggerhead sea turtle nests account for the vast majority of reported nesting (97.9 and 95.1 percent, respectively, from 1979 to 1992). During this same period, green sea turtle nests amounted to 0.2 percent of nesting state-wide and 4.2 percent within Region III. Nesting totals for each species differ substantially. From 1988 to 1992, while survey efforts remained relatively constant, the total number of reported loggerhead nests state-wide fluctuated between

37,242 and 68,614. Green sea turtle nests were reported to fluctuate between 455 and 2,509 during the same period. While totals differ, the distributions of loggerhead and green sea turtle nests follow a similar pattern on the east coast of Florida.

The most nesting activity by both species occurred outside of the action area to the north in Brevard County. Loggerhead and green sea turtles laid 39.4 percent and 39.5 percent, respectively, of their nests in Brevard County. Palm Beach County supported the second highest percentage of nests for both species with 17.8 percent of loggerhead nests and 23.1 percent of green sea turtle nests.

Broward County was sixth in importance as a nesting location for both species. Loggerhead sea turtles laid 3.4 percent of their nests here between 1979 and 1982 and green sea turtles laid 5.0 percent of their nests in Broward County during the same period. Dade County had a small but significant proportion of nests (0.6 for loggerheads and 0.3 for greens) from 1979 to 1992.

Between 1988 and 1992, annual reported leatherback sea turtle nests varied between 98 and 188 state-wide. The distribution of these nests differs from the loggerhead and green sea turtle nests discussed above. Leatherback nests have a center of distribution at Palm Beach County which supports more than half (50.1 percent) of the total nests reported state-wide. To the north, Martin and St. Lucie County beaches have been the site of 27.7 percent and 13.2 percent of leatherback nests, respectively. South of Palm Beach County, the number of leatherback nests declines more sharply. Broward County supported 3.0 percent of leatherback nesting and Dade County supported 1.6 percent.

The hawksbill sea turtles nest so rarely in Florida (only 11 nests reported state-wide from 1979 to 1992) that no distinct pattern of distribution is apparent. However, the majority (7) of those reported nestings have occurred within the Region III area. One hawksbill nest was reported from Palm Beach County in 1985 and two in 1992, one in Broward County in 1986, and one in 1981 and two in 1990 in Dade County.

B. Nesting within Region III

The average number of nests annually of each species within each Region III county are shown in Table 2. These data show that Palm Beach County is clearly the most important nesting location within the region for the endangered leatherback and green sea turtles. Less evident from Table 2 is the fact that as the total number of nests for these species declines from north to south, so too does the percentage that these nests contribute to total nesting activity. Green sea turtles lay 4.3 percent of total nests in Palm Beach and Broward Counties, but only 0.5 percent of the total in Dade County. Similarly, leatherback nests constitute 0.8 percent of the total in Palm Beach County but only 0.4 and 0.5 percent in Broward and Dade Counties, respectively.

Table 2. Average annual number of nests by county from 1992 to 1994

	Loggerhead	Green	Leatherback	Hawksbill
Palm Beach	12,133	544	99	1
Broward	2,226	101	11	0
Dade	401	2	2	0

C. Nesting activity trends in Region III

Throughout the state, the number of sea turtle nests (all species) per kilometer surveyed from 1979 to 1992 appears to have increased slightly. Loggerhead nest numbers vary enough from year to year to prevent Meylan *et al.* (1995) from drawing a firm conclusion that loggerhead nesting is increasing (see Figure 1). Kilometers surveyed increased as the study progressed, thus, the figures become increasingly reliable. It appears that loggerhead nesting activity could be on a four year cycle. Figure 1 shows peaks in nesting density for 1982, 1986, and 1990. Similarly, green sea turtle nesting exhibits a two year cycle in activity.

A trend toward increasing loggerhead nesting within Region III appears more evident as seen in Figure 2. The contribution from each county to each year's loggerhead nesting activity can be approximated by reviewing Table 2. All counties have a similar trend.

Dissimilar trends in green sea turtle nesting among Palm Beach, Broward, and Dade Counties occurred from 1979 to 1994. Nesting activity for each year by county is shown in Figure 3. The figure above shows a pronounced increase in green sea turtle nesting in Palm Beach County from 1990 to 1994. The phenomenon of higher nesting activity in alternating years can easily be seen in the years 1990, 1992, and 1994. This pattern can also be seen in the Broward County data. The trend toward increasing green sea turtle nesting activity over the long term is also clear from the figure. Dade County, however, shows a decrease in reported green sea turtle nesting per kilometer. Except in 1980, the number of nests per kilometer in Dade County is low, which could be due to random fluctuations in nesting activity. Meylan *et al.* (1995) report that an increase in green sea turtle nesting has been observed statewide. We do not know the reason for this increase is unknown and regard it with cautious optimism.

Figure 1: Average number of loggerhead nests per kilometer surveyed in Florida from 1979 to 1992

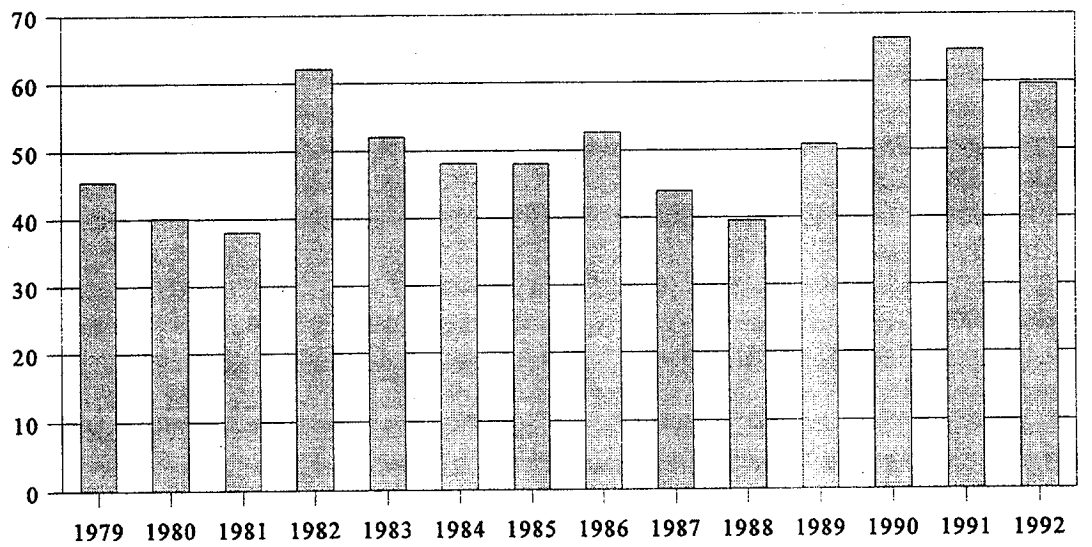


Figure 3. Green sea turtle nesting per kilometer surveyed for Dade, Broward and Palm Beach Counties, 1979 to 1994

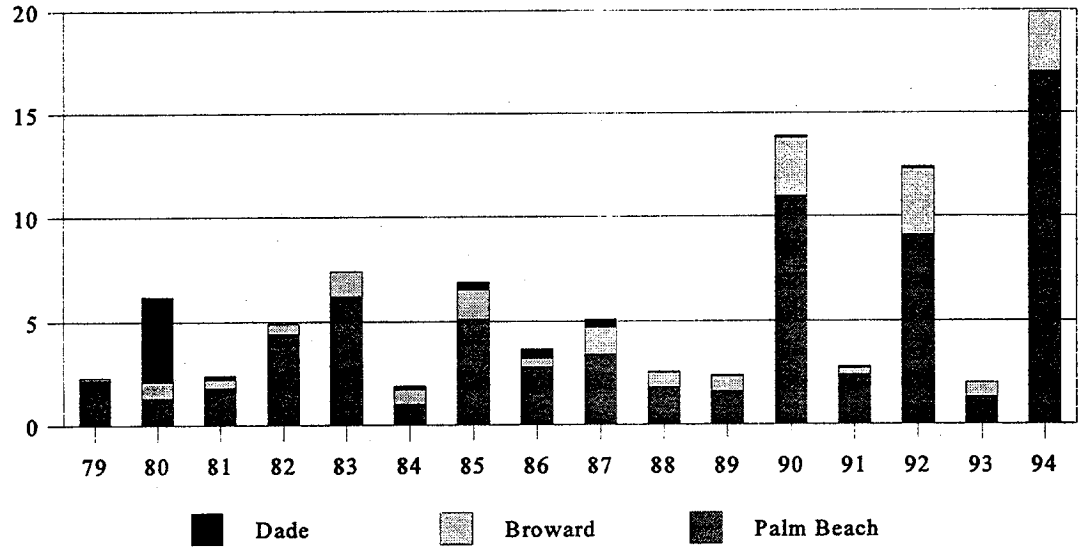
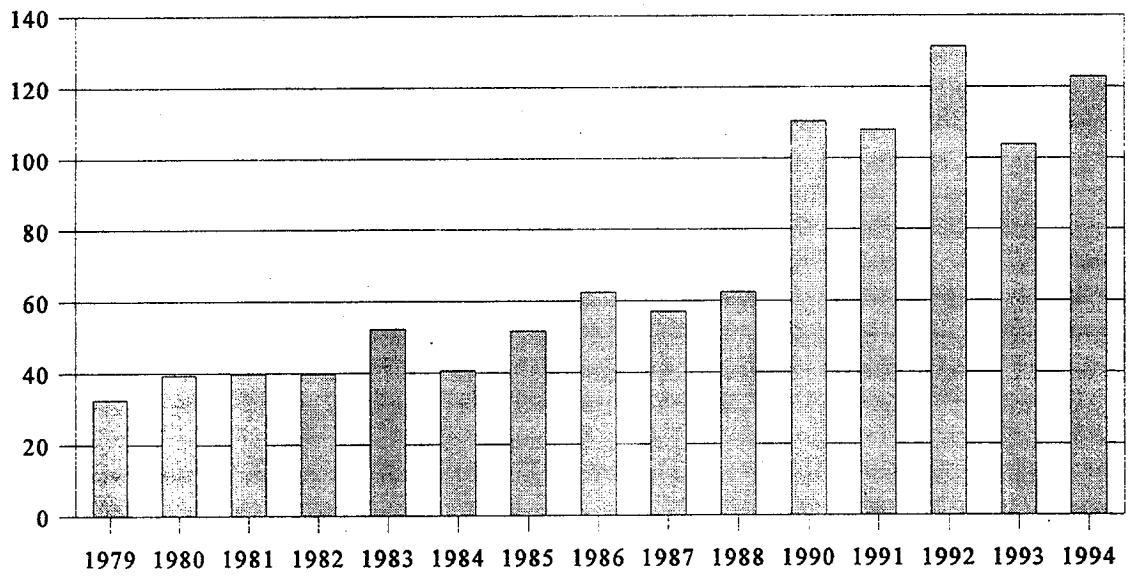


Figure 2. Average number of loggerhead nests per kilometer surveyed in Palm Beach, Broward, and Dade Counties, Florida, from 1979 to 1994



Leatherback nesting has fluctuated widely during the survey period between 1979 and 1994. In Palm Beach County, where the most leatherback nesting occurs, the reported nesting densities for the period vary from 0.3 nests per kilometer in 1980 to 2.3 nests per kilometer in 1994. A peak in nesting density occurred in 1983 when 1.8 nests per kilometer were reported. From 1979 to 1994, 735 leatherback nests were reported from Palm Beach County; Broward County reported 109 nests and Dade County reported 15 leatherback nests.

In Broward County, there is not a clear trend in leatherback nesting activity. Nests per kilometer ranged from 0.0 in 1990 to 0.7 in 1987. Nesting by leatherbacks in Dade County is too low to exhibit discernable trends.

No trends in nesting activity are evident in nesting frequency by the hawksbill sea turtle. As previously stated, however, seven hawksbill nests out of the 11 reported statewide from 1979 to 1994 were from Region III counties. Underreporting of hawksbill nests undoubtedly occurs as a result of their extended nesting season. Most seasonal beach surveys end in the late summer or early fall. Thus, hawksbill nests laid in late fall or early winter would not be included in the survey. Underreporting of leatherback nesting also occurs because leatherbacks begin nesting prior to the beginning of annual beach surveys. The nesting and hatching seasons for each species within Region III are given on the following page.

Species	**Nesting and Hatching Dates**
Loggerhead sea turtle	March 15 to November 30
Green sea turtle	May 1 to November 30
Leatherback sea turtle	February 15 to November 15
Hawksbill sea turtle	June 1 to December 31

D. Nest relocation

With few exceptions, most sea turtle nests are relocated from the beaches where they are laid in Broward and Dade Counties. This is done to protect the eggs and hatchlings from harm due to the high degree of human activity on these beaches. Most areas within these two counties are densely developed with multi-family residential (condominiums) and resort (hotels) development. The Atlantic shoreline at Golden Beach, Dade County and Hillsboro Beach, Broward County is developed with single-family residential development; public access and lighting are minimized. In these locations, nests are left *in situ*. Many of the Broward County nests are relocated to Hillsboro Beach. Nests are also left *in situ* at John U. Lloyd State Park, Broward County.

Both Broward and Dade Counties have been successful in hatching young loggerhead and green sea turtles from relocated nests. Broward County (1995) reports a 72.0 percent rate of hatching success for 1687 relocated nests. The 419 nests left *in situ* and monitored had a 76.6 percent hatching success rate. A significant fraction of the relocated nests (14) were laid by green turtles. Green turtle egg ciability was greatly reduced by relocation. Only 55.6 percent of relocated green turtle eggs hatched while 76.1 percent of *in situ* green turtle eggs hatched successfully. Results in Dade County were similar. For the 326 relocated loggerhead nests, there was a 79.3 percent successful hatch rate. For the 29 *in situ* nests, the rate of successful hatching was 73.3 percent (Steve Blair, personal communication).

E. Nesting activity within each project area

All of the areas proposed for renourishment include some suitable nesting habitat. However, the proposed projects will not be constructed for many years and the suitability of each area for sea turtle nesting will likely change in this timeframe. Thus, the FWS will address the effect of individual projects on sea turtle nesting within each project area in later biological opinions.

EFFECTS OF THE PROPOSED ACTION

Since 1988, approximately 15 miles of shoreline have been renourished in Region III. These previously authorized projects have had a substantial effect on sea turtle nesting. The new proposed projects would

add to these effects by increasing incidental take due to nest relocation during construction, through missed nests, and through changes in the nesting environment after project construction. Conversely, nesting habitat within Region III will be increased over that which would exist without beach nourishment and renourishment.

A. Direct effects

Although beach nourishment may increase the potential nesting area, sea turles may be adversely affected if protective measures are not incorporated into project planning and implementation. Placement of sand on an eroded section of beach or an existing beach, in an of itself, is not likely to provide suitable nesting habitat for sea turtles.

Nourishment and sand transfer during the nesting season, particularly on or near high density nesting beaches, can cause increased loss of offspring from human-caused mortality and may significantly affect the long-term survival of the species. For instance, projects conducted during the nesting and hatching season could result in the loss of sea turtles through disruption of adult nesting activity and by burial or crushing of nests or hatchlings. While a nest monitoring and egg relocation program would reduce these effects, nests may be inadvertently missed or misidentified as false crawls during daily patrols. In addition, nests may be destroyed by operations at night prior to beach patrols being performed. Even under the best conditions, about seven percent of the nests can be missed by experienced turtle nest surveyors (Schroeder 1994).

1. Nest relocation
   Besides the potential for missing nests during a relocation program, there is a potential for eggs to be damaged by their movement or for unknown biological mechanisms to be affected. Nest relocation can have adverse effects on incubation temperature (hence, sex ratios), gas exchange parameters, hydric environment of nests, hatching success, and hatchling emergence (Limpus *et al.* 1979, Ackerman 1980, Parmenter 1980, Spotila *et al.* 1983, McGehee 1990). Relocating nests into sand deficient in oxygen or moisture can result in mortality, morbidity, and reduced behavioral competence of hatchlings. Water availability is known to influence the incubation environment of the embryos and hatchlings of turtles with flexible-shelled eggs, which has been shown to affect nitrogen excretion (Packard *et al.* 1984), mobilization of calcium (Packard and Packard 1986), mobilization of yolk nutrients (Packard *et al.* 1985), hatchling size (Packard *et al.* 1981, McGehee 1990), energy reserves in the yolk at hatching (Packard *et al.* 1988), and locomotory ability of hatchlings (Miller *et al.* 1987).

   FDEP has noted significant variations in comparing hatching success and emergence success between *in situ* and relocated nests (unpublished data). In a 1994 study, Meylan (unpulished data) found variations of hatching and emergence success of *in situ* and relocated nests at seven sites in Florida. Hatching success was lower for relocated nests in five of seven cases with an average decrease for all seven sites of 5.01 percent (16.31 percent decrease ↔ 7.19 percent increase). Emergence success was lower for relocated nests in all seven cases by an average of 11.67 percent (23.36 percent decrease ↔ 3.6 percent decrease).

   A final concern with nest relocation is that it may concentrate eggs in an area resulting in a greater susceptibility to catastrophic events. Hatchlings released from concentrated areas may be subject to greater predation rates from both land and marine predators, who have adapted to concentrate their foraging efforts.

2. Equipment
The placement of pipelines and the use of heavy machinery on the beach during a construction project may also have adverse effects on sea turtles. They can create barriers to nesting females emerging from the surf and crawling up the beach, causing a higher incidence of false crawls and unnecessary energy expenditure.

3. Changes in the physical environment
Beach nourishment may result in changes in sand density (compaction), beach shear resistance (hardness), beach moisture content, beach slope, sand color, sand grain size, sand grain shape, and sand grain mineral content if the placed sand is dissimilar from the original beach sand (Nelson and Dickerson 1988a). These changes could result in adverse effects on nest site selection, digging behavior, clutch viability, and emergence by hatchlings (Nelson and Dickerson 1987, Nelson 1988).

4. Compaction
Beach compaction and unnatural beach profiles that may result from beach nourishment activities could adversely affect sea turtles regardless of the timing of the projects. Very fine sand and/or the use of heavy machinery can cause sand compaction on nourished beaches (Nelson *et al.* 1987, Nelson and Dickerson 1988a). Significant reductions in nesting success have been documented on severely compacted nourished beaches (Fletemeyer 1980, Raymond 1984, Nelson and Dickerson 1987, Nelson *et al.* 1987). Increased false crawls result in increased physiological stress to nesting females. Sand compaction may increase the length of time required for female sea turtles to excavate nests, again, causing increased physiological stress to the animals (Nelson and Dickerson 1988c). These effects can be minimized by using suitable sand and by tilling the beach after nourishment. Nelson and Dickerson (1988b) concluded that, in general, beaches nourished from offshore borrow sites are harder than natural beaches, and while some may soften over time through erosion and accretion of sand, others may remain hard for 10 years or more.

5. Escarpments
On nourished beaches, steep escarpments may develop along their water line interface as they adjust from an unnatural construction profile to a more natural beach profile (Coastal Engineering Research Center 1984, Nelson *et al.* 1987). These escarpments can hamper or prevent access to nesting sites. Female turtles coming ashore to nest can be discouraged by the formation of an escarpment, leading to situations where they choose marginal or unsuitable nesting areas to deposit eggs (e.g., in front of the escarpments which often results in failure of nests due to tidal inundation). This effect can be minimized by leveling the beach prior to the nesting season.

6. Sediment color
A change in sediment color on a beach could change the natural incubation temperatures of nests in an area which, in turn, could alter natural sex ratios. To provide the most suitable sediment for nesting sea turtles, the color of the nourished sediments must resemble the natural beach sand in the area. Natural reworking of sediments and bleaching from exposure to the sun would help to lighten dark nourishment sediments; however, the time frame for sediment mixing and bleaching to occur could be critical to a successful sea turtle nesting season.